

REMARKS

Claims 1-20, 23 and 24 have been examined and have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ryoo (US 5,990,957) and Sun (US 5,790,196).

A. Claim 1

Applicant submits that claim 1 is patentable over the cited references. For example, claim 1 recites, “a target bit number calculating means which performs a series of processes: calculating an uncoded VOP allocatable bit number that is the total number of allocatable bits for multiple uncoded VOPs in a certain period of time, wherein said calculation is based on a total number of allocatable bits for VOPs in a time span equal to the certain period of time and based on the number of generated bits for encoded VOPs in the time span, estimating the number of bits to be generated for encoding the multiple uncoded VOPs based on the predictive area calculating parameter and the predictive bit number calculating parameter, allocating the uncoded VOP allocatable bit number, calculating a target bit number for the next VOP to be encoded, and outputting the target bit number, sequentially for each of VOPs in the certain period of time.”

The following arguments were presented to the Examiner during the July 13, 2006 Examiner Interview between the Examiner and the undersigned. The Examiner indicated that he would reconsider his position upon review of the formal response. Also, the Examiner requested that the Applicant indicate where the specification supports the claimed recitation of calculating the allocatable bit number that is the total number of allocatable bits for “multiple” uncoded VOPs in a certain period of time (i.e., where the term “multiple” is supported in the

specification). In this regard, Applicant refers the Examiner to the non-limiting embodiments on page 18, lines 7-27 of the specification. As set forth, the target bit number calculator 102 allocates allocatable bits in a certain period of time. In lines 14-15, the certain period of time corresponds to a time interval taken for a GOV, where each GOV contains a number of VOPs (i.e., multiple VOPs).

Applicant submits that these statements serve as a Statement of Substance of Interview. In addition, the undersigned requested the Examiner to respond to the substance of all arguments presented if the rejections are to be maintained.

On pages 2 and 3 of the current Office Action, the Examiner refers to Figure 1 of Sun and appears to maintain that the calculation of the size of the video objects VO_1 and VO_2 discloses the claimed calculation of an *uncoded VOP allocatable bit number*. In this regard, the Examiner also refers to the claimed area calculator for calculating an area of the object in each VOP based on shape information data. However, as set forth in the March 8, 2006 Response, Applicant submits that Sun fails to disclose the claimed calculation of an uncoded VOP allocatable bit number. Applicant submits that the determination of a size of the video objects VO_1 and VO_2 of Sun fails to teach or suggest calculating *a total number of the bits allocatable* to the image frames VOP in a *certain period of time*.

Further, the Examiner again refers to column 8, lines 64-68 of Sun as disclosing a calculation of allocatable bits (pg. 3 of current Office Action). However, for the reasons set forth in the March 8, 2006 Response, Sun teaches that a target bit number for all objects in an (i.e., a single) uncoded VOP is distributed according to corresponding object associated header bits in a

previous frame to estimate a target bit number *for each object* in said uncoded VOP (col. 8, lines 50-55). In contrast, claim 1 requires, “calculating an uncoded VOP allocatable bit number, that is the total number of allocatable bits *for multiple uncoded VOPs* in a certain period of time, wherein said calculation is based on the total number of allocatable bits for VOPs in a time span equal to the certain period of time and based on the number of generated bits for encoded VOPs in the time span, . . .” (claim 1). Thus, claim 1 requires calculating an allocatable bit number for multiple VOPs in a certain period of time. On the contrary, Sun merely teaches allocating a target bit number for a VOP across VOs. Accordingly, Applicant submits that Sun fails to teach or suggest the claimed calculation of a total number of allocatable bits *for multiple uncoded VOPs in a certain period of time*.

Turning to the Ryoo reference, on page 3 of the current Office Action, the Examiner again refers to column 11, line 45 to column 12, line 9, of Ryoo, as disclosing a calculation of total allocatable bits for multiple uncoded VOPs in a certain period. However, as set forth in the March 8, 2006 Response, in column 11, lines 45-67, Ryoo teaches that “the entire bit amount is kept constant” even though the bit amount of respective VOPs is different ($VOP_0 \neq VOP_1 \neq VOP_2$).). In other words, the total number of bits for the sum of the VOPs in a given frame is kept constant, while the relative weighting of VOPs is varied (col. 11, lines 54-59; col. 12, lines 10-15; col. 12, lines 18-21 Abstract). Due to the total value being kept constant, there is no calculation necessary. The Examiner also cites to simulation results. However, such results verify, in part, the maintenance of the desired constant total bit amount of *a frame* while VOP weighting is varied (Abstract; col. 11, line 45 to col. 12, 21).

Further, in column 11, line 45 to col. 12, line 9, Ryoo merely suggests a method that comprises outputting the bit amount of each VOP, as shown in Table 2. Applicant submits that one ordinarily skilled in the art would neither conclude that this disclosure teaches, nor rely on this disclosure to teach or suggest, a target bit number calculating means which calculates a total number of allocatable bits for multiple uncoded VOPs in a certain period of time. One of ordinary skill in the art would readily recognize the difference between a number which is defined per frame and a number which is calculated and defined for a specified period of time.

At least for the failure of each reference to teach or suggest calculating a total number of allocatable bits *for multiple uncoded VOPs in a certain period of time*, alone or in combination, Applicant submits that claim 1 is patentable over the cited references.

In addition, claim 1 recites estimating the number of bits to be generated for encoding the multiple uncoded VOPs based on the predictive area calculating parameter, which is based on an object history.

Applicant again submits that the combination of Ryoo and Sun fail to teach or suggest the above feature. Ryoo teaches that target bits are calculated for respective VOPs (col. 10, lines 1-2). Further, the target bit rate *for each* VOP is determined in part by the macroblocks included in each VOP. (Ryoo col. 10, lines 11-13). Neither Ryoo, nor Sun teach or suggest estimating the number of bits to be generated *for encoding the multiple uncoded VOPs*.

In the March 8, 2006 Response, Applicant noted that the differences in syntactic structure in an MPEG-4 visually encoded data stream are complex but readily known and appreciated by one of ordinary skill in the art. Video Objects are patentably distinguishable from Video Object

Planes.¹ As set forth Sun makes calculations, estimations, and evaluations based on different structures and different data compared to that required by claim 1.

For at least the above reasons, Applicant submits that Sun fails to cure the deficient teachings of Ryoo. Accordingly, Applicant submits that claim 1 is patentable over the alleged combination of Ryoo and Sun, and respectfully requests the Examiner to reconsider and withdraw the rejection.

B. Claim 2

Claim 2 contains the subject matter asserted above in the traversal of the rejection of claim 1, calculating an allocatable VOP bit number for multiple VOPs in a certain period of time and estimating a number of bits to be generated for multiple uncoded VOPs in the certain period of time. An analogous argument to that presented above is hereby asserted in traversal of the rejection of claim 2. Therefore, at least for this deficiency the rejection of claim 2 as being obvious over Ryoo in view of Sun under 35 U.S.C. §103(a) should be withdrawn.

C. Claim 19

Claim 19 requires calculating an allocatable bit number, that is the total number of allocatable bits for multiple uncoded VOPs in a certain period of time. An analogous argument asserted in the traversal of claim 1 above is hereby asserted for claims 19. In turn, withdrawal of

¹ FIG 1 at <http://www.informatik.uni-mannheim.de/lib/publications/Kuehne1999a.pdf>; *Sun* at Fig. 1.

the rejection of claim 19 as being obvious over Ryoo in view of Sun under 35 U.S.C. §103(a) is deemed proper and respectfully requested.

D. Claims 5 and 6

Claims 5 and 6 require, calculating an uncoded frame allocatable bit number, which is a total number of allocatable bits for multiple uncoded frames in a certain period of time, wherein said calculation is based on a total number of allocatable bits for frames in a time span equal to the certain period of time and based on the number of generated bits for encoded frames in the time span. The Examiner applies the disclosure in Ryoo and Sun in the rejection of claims 5 and 6 as said references were applied in the rejection of claims 1 and 2.

For at least analogous reasons as set forth above for claim 1, Applicant submits that claims 5 and 6 are patentable over the cited references.

As discussed above in the traversal of claim 1, the Examiner acknowledges that Ryoo fails to disclose calculating an *uncoded VOP/FRAME* allocatable bit number (that is the total number of allocatable bits for multiple uncoded VOPs/FRAMEs *in a certain period of time*) based on the total number bits in uncoded VOPs and the total number of generated bits in encoded VOPs/FRAMEs *in a time span equal to the certain period of time* (OA dated December 8, 2005 at page 4). Therein, the Examiner relies on Sun to teach a means for calculating an uncoded VOP/FRAME allocatable bit number, and again cites to Sun at col. 8, lines 64-68 (OA dated December 8, 2005 at pages 4-5).

Sun teaches a constant output rate of generated bits, when encoding video data (col. 3, lines 13-15). Sun teaches adjustment of encoded output dependent upon parameters at the object level (col. 3, lines 17-29, col. 4, lines 26-29; col. 5, lines 9-15; col. 5, lines 35-38). More particularly, a total target bit number is adjusted proportional to the number of header bits used in the previous corresponding object (col. 3, lines 19-22; col. 6, lines 8-12; claims 1-3). Sun teaches that a target bit number for all objects in *an uncoded VOP* is distributed according to corresponding object associated header bits in a previous frame to estimate a target bit number *for each object* in said uncoded VOP (col. 8, lines 50-55).

Further, Sun teaches a target bit number corresponding to a single frame and target bit number for an uncoded VOP. Thus, Sun clearly teaches a difference in syntactic MPEG 4 structure, such that frames, VOPs, and VOs are not equivalent. Sun also fails to teach or suggest an uncoded frame allocatable bit number, that is the total number of allocatable bits for multiple uncoded frames in a certain period of time. The subject matter of claims 5 and 6 incorporate calculation of a parameter corresponding *to multiple frames* to be encoded in the future.

The Examiner asserts that “Sun suggests calculating an unencoded allocatable bit number corresponding to multiple uncoded VOPs within frames and also for each VO and VOPs of the frame (OA dated December 8, 2006 at page 6, Examiner citing to Sun , T of Table 1). However, T in Table 1 is not the result of addition of VOPs included in multiple frames but rather is the result of addition of VOPs in one picture (frame). While perhaps not clear from the definition of Table 1, Applicant asserts that *Buff_drain* is a value for one picture according to the definition of Table 1. In turn, *T_inc* is determined based on *Buff_drain* and therein T is also given at every

picture (frame). In addition buffer control is typically conducted while one picture is handled as a single unit. In conclusion, Sun does not teach calculating the bit amount for VOPs in multiple frames, but rather teaches calculating the bit amount for VOPs in the one frame that is going to be encoded.

In view of the above, Applicant submits that Ryoo and Sun fail to teach or suggest, alone or in combination, calculating an uncoded Frame allocatable bit number, corresponding to multiple uncoded Frames in a certain time period. At least for this deficiency, the rejection of claims 5 and 6, as being unpatentable over Ryoo in view of Sun under 35 U.S.C. §103(a), should be withdrawn.

E. Claim 20

Claim 20 requires the subject matter relied on in the traversal of the rejection of claims 5 and 6 above. Accordingly, an analogous argument to that presented above in traversal of the rejection of claims 5 and 6 is hereby asserted in traversal of the rejection of claim 20. Therefore, withdrawal of the rejection of claim 20 as being unpatentable over *Ryoo* in view of *Sun* under 35 U.S.C. §103(a) is deemed proper and is respectfully requested.

F. Claims 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18

Applicant asserts the patentability of claims 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18 at least by virtue of their dependency upon one of independent claims 1, 2, 5 and 6.

G. Claims 23 and 24

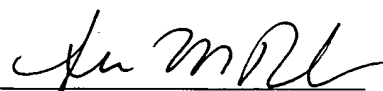
Applicant asserts the patentability of claims 23 and 24 at least by virtue of their dependency on claims 19 and 20, respectively.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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